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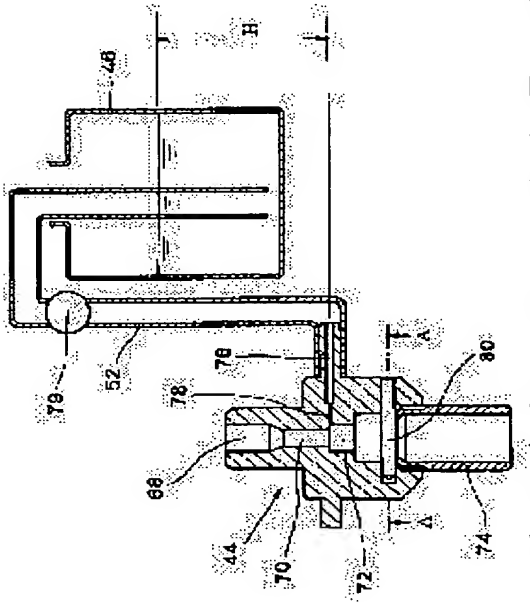
(54) CHEMICAL LIQUID DILUTING APPARATUS



(57)Abstract:

PROBLEM TO BE SOLVED: To lower the cost by making a flow rate-regulating valve, which is conventionally required, unnecessary and to control the concentration of a chemical agent diluted with a narrow alteration magnitude even if the flow rate of tap water is fluctuated.

SOLUTION: A tank 46 containing a chemical liquid is housed in a case and the case and an ejector 44 are fixed. That is, the tank 46 and the ejector 44 are positioned in a fixed state. Consequently, a flow rate-regulating valve, which is a conventionally required, is made unnecessary. Further, the head difference between height of the liquid surface of the chemical liquid in the tank 46 and the height of the communication position of the chemical liquid introduction route to the negative pressure generation part of the ejector 44 can be kept within a narrow range and thus the fluctuation of the concentration by dilution can be suppressed or eliminated even if the flow rate of tap water is increased.

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[Claim(s)]

[Claim 1] It has the ejector in which the path which passes the tap water which connects with the faucet of a waterworks and is supplied from the faucet was formed. Form the negative pressure generating section by the path aspect change in the path of the ejector, and it has the tank which contained the drug solution. Connect the tank and said negative pressure generating section at a drug solution installation path, and negative pressure is generated in the negative pressure generating section of said ejector with the tap water supplied from said faucet. In the drug solution dilution equipment with which the drug solution in said tank is introduced into said negative pressure generating section through said drug solution installation path, and tap water and a drug solution are mixed with the negative pressure Drug solution dilution equipment which makes said ejector and said tank a location fixed condition, and is characterized by making it not have a flow rate adjustable control valve in the middle of said drug solution installation path.

[Claim 2] Drug solution dilution equipment according to claim 1 characterized by having a converging section in the middle of said drug solution installation path.

[Claim 3] or it carries out the regurgitation of the tap water outside directly by having a change-over valve linked to said faucet, and switching the change-over valve -- said ejector -- ****** -- the drug solution dilution equipment according to claim 1 to 2 characterized by making it like.

[Claim 4] Drug solution dilution equipment according to claim 1 to 3 which will be characterized by setting the head difference H to 0 mm<=H<=60mm if a head difference with the height of the location which said drug solution installation path connects to said negative pressure generating section in the height and said ejector of an oil level of said tank is set to H.

[Claim 5] Drug solution dilution equipment according to claim 1 to 4 characterized by at least for the water which maintains a fixed oil level having introduced the drug solution in said tank into the maintenance device, and at least said water connecting a maintenance device and said drug solution installation path.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the drug solution dilution equipment for mixing drug solutions, such as an antibacterial, by moderate concentration to tap water.

[0002]

[Description of the Prior Art] From the former, in order to perform those sterilization and disinfection at the time of washing of a tableware, fresh vegetables, etc., JP,4-51633,Y etc. is provided with the drug solution dilution equipment which mixes drug solutions, such as an antibacterial, to tap water. Here, the configuration of the conventional known is shown to drawing 7 . In drawing 7 , the ejector 14 for mixing drug solutions, such as an antibacterial, with tap water through the faucet electrode holder 12 is attached in the faucet 10 of a waterworks. The tank 16 into which drug solutions, such as an antibacterial, were put is connected with the concentration controller 20 through the hose 18, and the concentration controller 20 is connected with said ejector 14 through the hose 22. Into the concentration controller 20, it has the flow rate adjustable control valves 24, such as a needle valve for adjusting the flow rate of the drug solution from a tank 16, and the check valve 26 for preventing the inflow of the tap water from an ejector 14 to a tank 16.

[0003] As shown in drawing 8 , the interior of an ejector 14 is equipped with the water path 28 through which connects with the faucet 10 side of a waterworks and tap water passes, the large mixed space 32 of the cross section is formed in the downstream of the venturi tube section 30 and its venturi tube section 30 in the middle of [it] the water path 28, and the downstream is equipped with the water discharge part 34 from the mixed space 32. If the negative pressure generating section by the path aspect change is formed in the venturi tube section 30 and the mixed space 32 and tap water passes through the water path 28, negative pressure will arise in the location where tap water came out from the venturi tube section 30 to the mixed space 32. The drug solution interconnecting catwalk 36 connected with a hose 22 to the location connected to the mixed space 32 from the venturi tube section 30 is connected. If tap water is supplied to an ejector 14, a drug solution will be supplied to the mixed space 32 through a hose 22 by the negative pressure generated in the negative pressure generating section from a tank 16, and a drug solution will be mixed by tap water in the mixed space 32 with it. The amount of the drug solution supplied to the mixed space 32 is adjusted by the flow rate adjustable control valve 24, and becomes

mixed water of desired concentration in the mixed space 32, and the mixed water is breathed out outside from the water discharge part 34.

[0004]

[Problem(s) to be Solved by the Invention] With conventional dilution equipment, when the flow rate of tap water increases, there is an inclination which the dilution concentration of a drug solution also increases. It placed the tank 10 caudad from the ejector 14, and as this inclination moreover had the large difference of elevation with the injection location (communication location of the drug solution interconnecting catwalk 36 to the mixed space 32) of the drug solution to the oil level and ejector 14 of a tank 10, it was more remarkable. Generally a tank 10 is placed on a sink from the former, and the ejector 14 attached in a faucet 10 is arranged about 15cm from a sink at a high order in many cases. Here, the difference of elevation shows the flow rate of tap water and the property of dilution concentration in -150mm (the oil level of a tank 10 is lower than the drug solution injection location to an ejector 14 150mm) to drawing 8 by x mark. When the flow rate of tap water increases according to the property Fig. of this drawing 8 , it turns out that the dilution concentration of a drug solution also increases.

[0005] Since a tank 10 is arranged to an ejector 14 at the height of the arbitration from the upper part to a lower part, no matter a tank 10 may be in what relative height to an ejector 14, in order to obtain desired dilution concentration, it needed to have the flow rate adjustable control valves 24, such as a needle valve, and the supply flow rate to the ejector 14 of a drug solution needed to be adjusted by the flow rate adjustable control valve 24. Therefore, not only cost quantity but adjustment was complicated, and fear of an alignment error also had it further.

[0006] Even if this invention has change of the flow rate of tap water, it offers the drug solution dilution equipment which can make change of the dilution concentration of a drug solution small, while it was made in view of the above-mentioned point, makes unnecessary the flow rate adjustable control valve needed conventionally and plans cost DAUUN.

[0007]

[Means for Solving the Problem] It has the ejector in which the path which passes the tap water which connects this invention with the faucet of a waterworks and is supplied from the faucet in order to attain the above-mentioned purpose was formed. Form the negative pressure generating section by the path aspect change in the path of the ejector, and it has the tank which contained the drug solution. Connect the tank and said negative pressure generating section at a drug solution installation path,

and negative pressure is generated in the negative pressure generating section of said ejector with the tap water supplied from said faucet. In the drug solution dilution equipment with which the drug solution in said tank is introduced into said negative pressure generating section through said drug solution installation path, and tap water and a drug solution are mixed with the negative pressure Said ejector and said tank are made into a location fixed condition, and it is made not to have a flow rate adjustable control valve in the middle of said drug solution installation path. In this invention, further, at least the water which keeps the water level of a drug solution constant introduces the drug solution in a tank into a maintenance device, and at least the water connects a maintenance device and a drug solution installation path.

[0008]

[Embodiment of the Invention] Next, this invention is explained based on a drawing. Drawing 1 is the perspective view showing 1 operation gestalt of the drug solution dilution equipment concerning this invention. The ejector 44 for mixing drug solutions, such as an antibacterial, with tap water through the faucet electrode holder 42 is attached in the faucet 40 of a waterworks. The case 48 which contains the tank 46 (drawing 2) which puts drug solutions, such as an antibacterial, into this ejector 44 inside is fixed. The interior of a case 48 is equipped with the hose 52 with which at least the water for holding the oil level of the drug solution picked out from the tank 46 and the tank 46 in a fixed location connects the other end with the maintenance device 50 with an ejector 44 while at least this water connects an end with the maintenance device 50. Although at least a tank 46 and water constituted the case 48 which contains the maintenance device 50 inside on another object in the ejector 44 and were fixed with the case 48 and the ejector 44, you may make it at least an ejector 44, a tank 46, and water equip with the maintenance device 50 one case which is not illustrated in drawing 1 . That is, in this invention, it considers as the location fixed condition that physical relationship does not displace a tank 46 relatively to an ejector 44.

[0009] In drawing 2 , it consists of the protrusion rod 58 which at least water is fixed to the valve element 56 to which the maintenance device 50 opens and closes the opening 54 of a tank 46, and its valve element 56 and one, and is extended outside from the inside of opening 54, and the cistern 60 for turning the opening 54 of a tank 46 down in support of a tank 46 from the bottom, and holding the opening 54 in a building envelope. A flange 62 is formed in the valve element 56 and the opposite side of the protrusion rod 58,

the inner direction lobe 64 is formed in the wall of the opening 54 of a tank 46, and it has a spring 66 between these flanges 62 and the method lobe 64 of inside.

[0010] If the opening 54 is turned down and a tank 46 is carried on a cistern 60, a flange 62 will contact the inferior surface of tongue inside a cistern 60, the opening 54 of push and a tank 46 will open a valve element 56 up, and the drug solution in a tank 46 will be supplied in a cistern 60. If the oil level of the drug solution supplied in the cistern 60 goes up and the opening 54 of a tank 46 is closed by the oil level of the drug solution, supply of the drug solution to the cistern 60 out of a tank 46 will stop. The drug solution in a cistern 60 is supplied to an ejector 44 via a hose 52 with the waterworks supply from a faucet 40. Then, if the oil level in a cistern 60 descends, as shown in drawing 3 , the opening 54 of a tank 46 will open and the drug solution in a tank 46 will be supplied in a cistern 60. Then, if the oil level of a drug solution goes up and the opening 54 of a tank 46 is closed by the oil level of a drug solution, supply of the drug solution to the cistern 60 out of a tank 46 will stop. Thus, the maintenance device 50 always maintains the oil level of a drug solution at fixed height at least for water. By always maintaining the oil level of a drug solution at fixed height, the head difference mentioned later can always be made regularity.

[0011] Next, the sectional view of an ejector 44 is shown in drawing 4 . As shown in drawing 4 , an ejector 44 has the water path 68 which passes the tap water which connects with the faucet 40 side of a waterworks and is supplied from a faucet 40. the water path 68 -- on the way -- alike -- the venturi tube section 70 and its venturi tube section 70 -- the large mixed space 72 of the cross section is immediately formed in the downstream from the venturi tube section 70. The negative pressure generating section consists of the venturi tube section 70 and first mixing space 72. The downstream is equipped with the water discharge part 74 for carrying out the regurgitation of the water from an ejector 44 outside from the mixed space 72. The drug solution interconnecting catwalk 76 connecting with a hose 52 is formed in the location near the venturi tube section 70 of the mixed space 72 in an ejector 44. It extracts in the middle of this drug solution interconnecting catwalk 76, and 78 is formed. In the middle of the hose 52, it has the check valve 79 for preventing the inflow of the water of tank 46 HE from an ejector 44.

[0012] If a faucet 40 is opened and tap water is supplied to an ejector 44, negative pressure will occur in the location which came out from the venturi tube section 70 to the large mixed space 72 of the cross section. The tap

water and the drug solution which the drug solution was supplied to the mixed space 72 by this negative pressure through the drug solution interconnecting catwalk 76 at the hose 52 list, and tap water and a drug solution were mixed in that mixed space 72, and were mixed are breathed out outside from the water discharge part 74. Between the mixed space 72 and the water discharge part 74, the round bar 80 is arranged so that the cross section of the water path 68 may be crossed. With this round bar 80, mixing of tap water and a drug solution is promoted and a drug solution and tap water dilute at homogeneity.

[0013] In this invention constituted as mentioned above, it considered as the location fixed condition that a mutual relative location does not displace an ejector 44 and a tank 46. This can maintain the head difference H of the oil level of a tank 46, and an ejector 44 (communication location of the drug solution interconnecting catwalk 76 to the mixed space 72) at fixed relation or the relation of fixed within the limits. Here, at least the water of drawing 2 means the oil level in a cistern 60 in the maintenance device 50, and the height of the oil level of the oil level of a tank 46 is always fixed. Moreover, as shown in drawing 4 , when the opening 54 of a tank 46 is turned upward, the oil level of a tank 46 is displaced from the height of opening 54 to height at the bottom within the limits of the height of a tank 46.

[0014] Since it considered as the location fixed condition that a mutual relative location does not displace an ejector 44 and a tank 46, it becomes unnecessary to have the flow rate adjustable control valve needed conventionally in this invention. Moreover, since the ejector 44 and the tank 46 were made into the location fixed condition and the head difference H of the oil level of a tank 46 and an ejector 44 becomes small, even if there is change of the flow rate of tap water, there is little change of the dilution concentration of a drug solution. For this reason, it extracts and the thing which set up beforehand and to acquire for desired dilution concentration becomes possible by 78.

[0015] When the head difference of the height of the oil level of a tank 46 and the height which the drug solution interconnecting catwalk 76 connects to the mixed space 72 is set to H (drawing 4) here, being referred to as 0 mm<=H<=60mm is desirable. In drawing 8 , O mark shows the flow rate of tap water and the property of dilution concentration in case the head difference H is 30mm here. The property expressed with this O mark shows that change of dilution concentration is small, even if the flow rate of tap water increases. Although dilution concentration will increase a little compared with the case where the head difference H is 30mm if a flow rate

increases when the head difference H is 0mm, although not shown in drawing 8, there is few the increment extent. Moreover, when the head difference H is 60mm, change of dilution concentration is smaller than the case where the head difference H is 30mm.

[0016] Here, the minimum of the head difference H was set to 0mm because a drug solution would become is hard to be supplied when there are few flow rates of tap water if the head difference H of the tank 46 to an ejector 44 is subtracted. On the other hand, if the head difference H becomes large too much, even if it stops tap water according to a siphon phenomenon, the problem on which a drug solution continues flowing will arise. The upper limit of the head difference H was set to 60mm because a siphon phenomenon was prevented by duct resistance. It is because a special device must be added and it will become cost quantity, in order for there to be a possibility that a siphon phenomenon may occur and to prevent it if the head difference H exceeds 60mm.

[0017] Next, the modification of this invention is shown in drawing 6 . In drawing 6 , the same sign as drawing 1 expresses the same member. A change-over valve 82 is attached at the tip of the faucet 40 of a waterworks, and the change-over valve 82 is connected to the ejector 44 through the hose 84. A change-over valve 82 switches to the mode which carries out the regurgitation of the tap water to the exterior directly from there, and the mode which introduces tap water into an ejector 44. Also in drawing 6 , it changes the ejector 44 and the tank 46 into the location fixed condition. Therefore, also in drawing 6 , a flow control valve is omitted, and even if the flow rate of tap water increases, the dilution concentration by which the request was stabilized can be obtained.

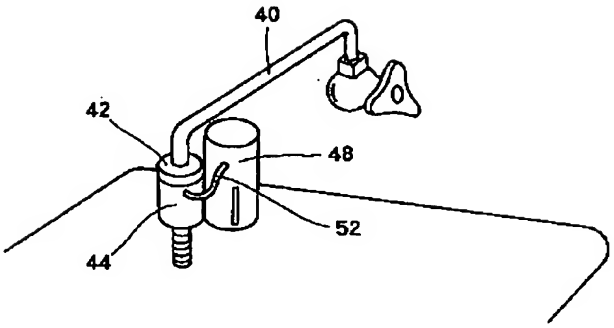
[0018]

[Effect of the Invention] as mentioned above, according to the drug solution dilution equipment concerning this invention, since the ejector and the tank were made into the location fixed condition, even if it can omit the flow rate adjustable control valve which can make the head difference of an ejector and a tank fixed within the limits, out of which it came and which was needed conventionally and the flow rate of tap water increases, it can be made small that the dilution concentration of a drug solution changes. Furthermore, by setting the head difference H to 0 mm<=H<=60mm, even if the flow rate of tap water increases, change of the dilution concentration of a drug solution can be made still smaller. Moreover, at least water can prevent change of the dilution concentration of the drug solution to change of the amount of drug solutions of a tank by establishing a maintenance device.

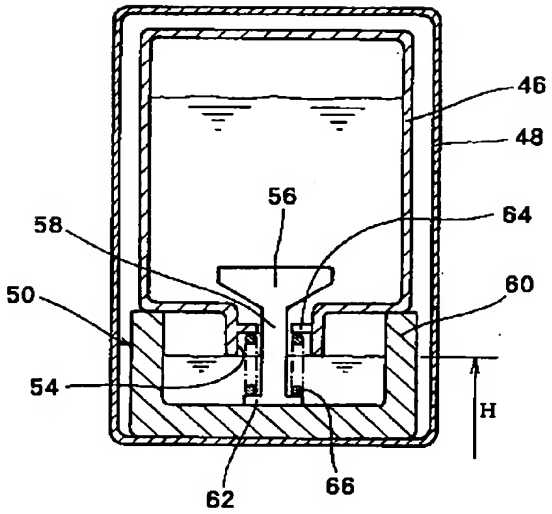
[Brief Description of the Drawings]
[Drawing 1] It is the perspective view showing 1 operation gestalt of the drug solution dilution equipment concerning this invention.
[Drawing 2] It is the sectional view showing the tank used for drawing 1 , and a cistern.
[Drawing 3] It is the important section expanded sectional view of drawing 2 showing the condition of supplying a drug solution to a cistern from a tank.
[Drawing 4] It is the sectional view of the ejector used for this invention.
[Drawing 5] It is the A-A line sectional view of drawing 4 .
[Drawing 6] It is the perspective view showing other operation gestalten of the drug solution dilution equipment concerning this invention.
[Drawing 7] It is the perspective view showing conventional drug solution dilution equipment.
[Drawing 8] It is the sectional view of the ejector used for drawing 7 .
[Drawing 9] It is the property Fig. showing the flow rate of tap water and the property of dilution concentration in conventional drug solution dilution equipment and the drug solution dilution equipment of this invention.
[Description of Notations]
40 Faucet
44 Ejector
46 Tank
48 Case
50 At Least Water is Maintenance Device.
52 Hose
54 Opening
56 Valve Element
60 Cistern
70 Venturi Tube Section
72 Mixed Space
76 Drug Solution Interconnecting Catwalk
78 Drawing
82 Change-over Valve
84 Hose

[Drawings]

[Drawing 1]



[Drawing 2]



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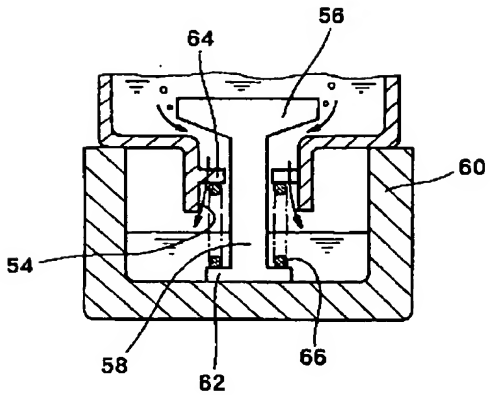

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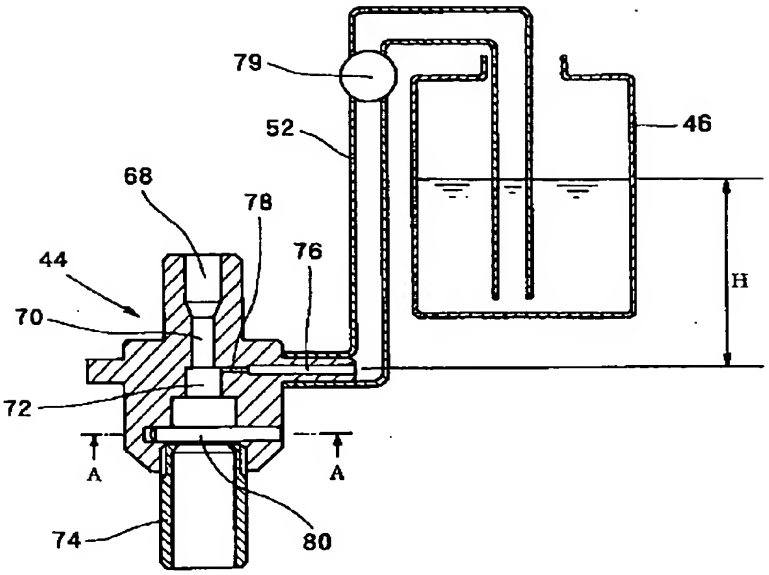
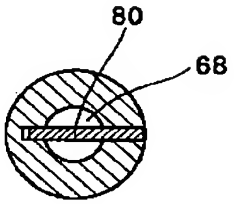
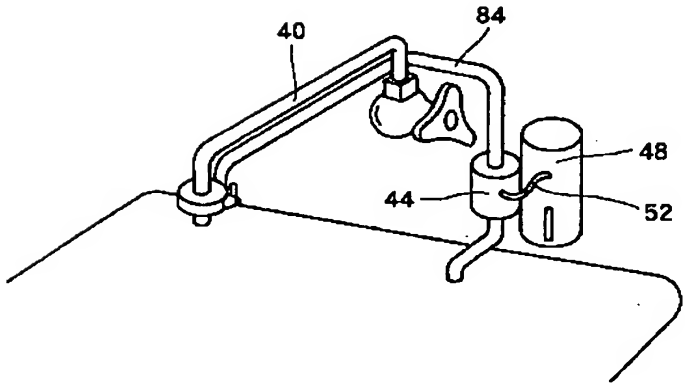


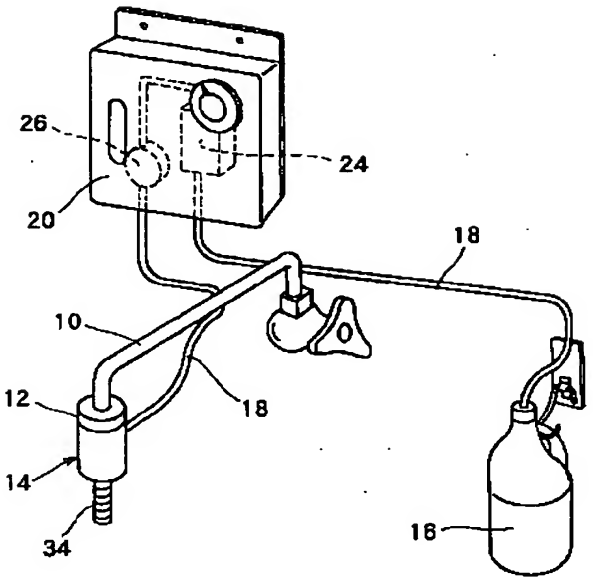
[Drawing 5]



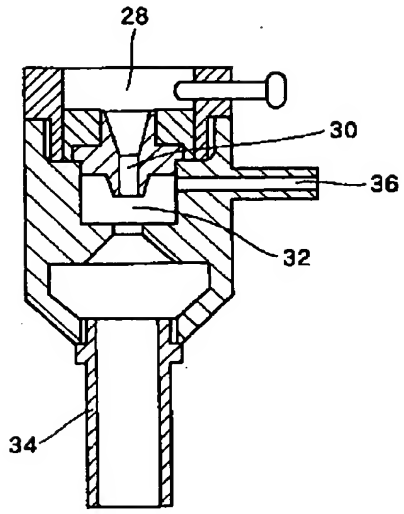
[Drawing 6]



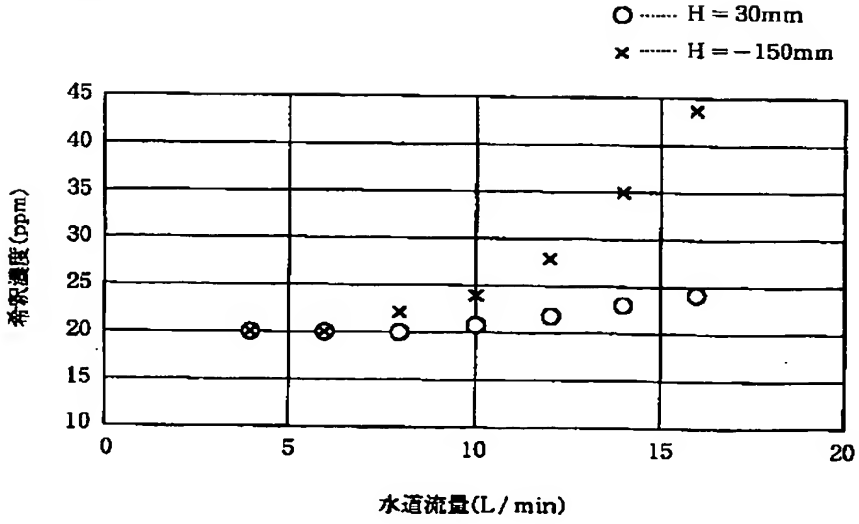
[Drawing 7]



[Drawing 8]



[Drawing 9]



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	3/08	3/08	Ｚ
	5/04	5/04	
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最終頁に続く

(54)【発明の名称】　薬液希釈装置

(57)【特許請求の範囲】

【請求項１】　水道の蛇口と連絡してその蛇口から供給される水道水を通過させる通路を形成したエジェクタを有し、そのエジェクタの通路に通路断面変化による負圧発生部を形成し、薬液を収納したタンクを有し、そのタンクと前記負圧発生部とを薬液導入通路で連絡し、前記蛇口から供給された水道水によって前記エジェクタの負圧発生部に負圧を発生し、その負圧によって前記タンク内の薬液を前記薬液導入通路を経て前記負圧発生部に導入して水道水と薬液とを混合させる薬液希釈装置において、前記薬液導入通路の途中に流量可変調節弁を備えないようにし、前記エジェクタと前記タンクとを位置固定状態とし、一定の液面を保つ水位保持機構を前記タンクと位置固定関係に備え、その水位保持機構と前記薬液導入通路と連絡し、前記タンク内の薬液を前記水位保持機

構に導入し、前記負圧発生部に発生する負圧によって前記水位保持機構内の薬液を前記薬液導入通路から前記エジェクタに導入するようにしたことを特徴とする薬液希釈装置。

【請求項２】　前記薬液導入通路の途中に絞り部を備えたことを特徴とする請求項１記載の薬液希釈装置。

【請求項３】　前記蛇口に接続する切換弁を備え、その切換弁を切り換えることによって、水道水を直接外部に吐出するか前記エジェクタに導入するようにしたことを特徴とする請求項１乃至２記載の薬液希釈装置。

【請求項４】　前記タンクの液面の高さと前記エジェクタにおける前記負圧発生部に前記薬液導入通路が連絡する位置の高さとのヘッド差をＨとすると、そのヘッド差Ｈを０ｍｍ≦Ｈ≦６０ｍｍとしたことを特徴とする請求項１乃至３記載の薬液希釈装置。

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【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、水道水に消毒液等の薬液を適度の濃度で混合するための薬液希釈装置に関する。

【０００２】

【従来の技術】従来から、食器類や生野菜等の洗浄時にそれらの殺菌や消毒を行うために、水道水に消毒液等の薬液を混合する薬液希釈装置が、実公平４－５１６３３号等に提供されている。ここで、その従来既知の構成を図７に示す。図７において、水道の蛇口１０には、蛇口ホルダー１２を介して水道水と消毒液等の薬液を混合するためのエジェクタ１４が取り付けられている。消毒液等の薬液を入れたタンク１６はホース１８を介して濃度調節器２０と連結されており、その濃度調節器２０はホース２２を介して前記エジェクタ１４と連結されている。濃度調節器２０の中には、タンク１６からの薬液の流量を調節するためのニードルバルブ等の流量可変調節弁２４と、エジェクタ１４からタンク１６への水道水の流入を防止するための逆止弁２６が備えられる。

【０００３】図８に示すように、エジェクタ１４の内部には、水道の蛇口１０側と連絡し水道水が通過する水通路２８を備え、その水通路２８の途中にベンチュリー部３０とそのベンチュリー部３０の下流側にそれより断面積の広い混合空間３２とを形成し、その混合空間３２より下流側に水吐出部３４を備える。ベンチュリー部３０と混合空間３２とで通路断面変化による負圧発生部が形成され、水通路２８を水道水が通過すると、ベンチュリー部３０から混合空間３２に水道水が出た位置で負圧が生じる。ベンチュリー部３０から混合空間３２に連絡する位置に、ホース２２と連絡する薬液連絡通路３６が接続される。エジェクタ１４に水道水が供給されると、負圧発生部で発生する負圧によって、タンク１６からホース２２を経て混合空間３２に薬液が供給され、混合空間３２内で水道水に薬液が混合される。混合空間３２に供給される薬液の量は流量可変調節弁２４によって調節され、混合空間３２内で所望の濃度の混合水になり、その混合水が水吐出部３４から外部に吐出される。

【０００４】

【発明が解決しようとする課題】従来の希釈装置では、水道水の流量が増加すると、薬液の希釈濃度も増加する傾向がある。この傾向は、タンク１６をエジェクタ１４より下方に置き、しかもタンク１６の液面とエジェクタ１４への薬液の投入位置（混合空間３２への薬液連絡通路３６の連絡位置）との高低差が大きければ大きい程顕著であった。従来から一般に、タンク１６は流し台の上に置かれ、蛇口１０に取り付けるエジェクタ１４は流し台より１５ｃｍ程度上位に配置されることが多い。ここで、図８に高低差が－１５０ｍｍ（タンク１６の液面がエジェクタ１４への薬液投入位置より１５０ｍｍ低い）

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の場合における水道水の流量と希釈濃度の特性を×印で示す。この図９の特性図によると、水道水の流量が増加すると、薬液の希釈濃度も増加することが分かる。

【０００５】タンク１６がエジェクタ１４に対して上方から下方までの任意の高さに配置されるため、タンク１６がエジェクタ１４に対してどのような相対的な高さにあっても所望の希釈濃度を得るためには、ニードルバルブ等の流量可変調節弁２４を備え、流量可変調節弁２４によって薬液のエジェクタ１４への供給流量を調節する必要があった。そのため、コスト高のみならず、調整が煩雑で、さらには誤調整の恐れもあった。

【０００６】本発明は上記の点に鑑みてなされたもので、従来必要とした流量可変調節弁を不要としてコストダウンを図ると共に、水道水の流量の変化があっても薬液の希釈濃度の変化を小さくすることができる薬液希釈装置を提供するものである。

【０００７】

【課題を解決するための手段】上記目的を達成するために本願発明は、水道の蛇口と連絡してその蛇口から供給される水道水を通過させる通路を形成したエジェクタを有し、そのエジェクタの通路に通路断面変化による負圧発生部を形成し、薬液を収納したタンクを有し、そのタンクと前記負圧発生部とを薬液導入通路で連絡し、前記蛇口から供給された水道水によって前記エジェクタの負圧発生部に負圧を発生し、その負圧によって前記タンク内の薬液を前記薬液導入通路を経て前記負圧発生部に導入して水道水と薬液とを混合させる薬液希釈装置において、前記薬液導入通路の途中に流量可変調節弁を備えないようにし、前記エジェクタと前記タンクとを位置固定状態とし、一定の液面を保つ水位保持機構を前記タンクと位置固定関係に備え、その水位保持機構と前記薬液導入通路と連絡し、前記タンク内の薬液を前記水位保持機構に導入し、前記負圧発生部に発生する負圧によって水位保持機構内の薬液を前記薬液導入通路から前記エジェクタに導入するようにしたものである。

【０００８】

【発明の実施の形態】次に本発明を図面に基づいて説明する。図１は本発明に係わる薬液希釈装置の一実施形態を示す斜視図である。水道の蛇口４０には、蛇口ホルダー４２を介して水道水と消毒液等の薬液を混合するためのエジェクタ４４が取り付けられている。このエジェクタ４４に、消毒液等の薬液を入れるタンク４６（図２）を内部に収納するケース４８が固定される。ケース４８の内部には、タンク４６と、タンク４６から取り出した薬液の液面を一定位置に保持するための水位保持機構５０と、この水位保持機構５０に一端を連結すると共に他端をエジェクタ４４と連結するホース５２とが備えられる。図１においては、タンク４６や水位保持機構５０を内部に収納するケース４８をエジェクタ４４とは別体に構成して、ケース４８とエジェクタ４４と固定したが、

図示しない１個のケースにエジェクタ４４とタンク４６と水位保持機構５０とを備えるようにしても良い。即ち、本発明ではエジェクタ４４に対してタンク４６を相対的に位置関係が変位しない位置固定状態とする。

【０００９】図２において水位保持機構５０は、タンク４６の開口部５４を開閉する弁体５６と、その弁体５６と一体に固定されるもので開口部５４の内側から外側に伸びる突出棒５８と、タンク４６を下側から支持するものであってタンク４６の開口部５４を下にしてその開口部５４を内部空間に収容するための液槽６０とから成る。突出棒５８の弁体５６と反対側にはフランジ６２が形成され、タンク４６の開口部５４の内壁に内方突出部６４が形成され、それらフランジ６２と内方突出部６４との間にスプリング６６が備えられる。

【００１０】タンク４６をその開口部５４を下にして液槽６０の上に載せると、フランジ６２が液槽６０の内部の下面と接触して弁体５６を上方に押し、タンク４６の開口部５４が開いてタンク４６内の薬液が液槽６０内に供給される。液槽６０内に供給された薬液の液面が上昇して、その薬液の液面によってタンク４６の開口部５４が閉じられると、タンク４６内から液槽６０への薬液の供給が停止する。液槽６０内の薬液は、蛇口４０からの水道供給に伴ってホース５２を経由してエジェクタ４４に供給される。その後、液槽６０内の液面が下降すると、図３に示すように、タンク４６の開口部５４が開いて、タンク４６内の薬液が液槽６０内に供給される。その後、薬液の液面が上昇して、薬液の液面によってタンク４６の開口部５４が閉じられると、タンク４６内から液槽６０への薬液の供給が停止する。このように、水位保持機構５０は、薬液の液面を常に一定の高さに保つものである。薬液の液面を常に一定の高さに保つことによって、後述するヘッド差を常に一定にすることができる。

【００１１】次に、エジェクタ４４の断面図を図４に示す。図４に示すように、エジェクタ４４は、水道の蛇口４０側と連絡して蛇口４０から供給される水道水を通過させる水通路６８を有する。水通路６８の途中に、ベンチュリー部７０と、そのベンチュリー部７０のすぐ下流側にベンチュリー部７０より断面積の広い混合空間７２とを形成する。ベンチュリー部７０と第一混合空間７２とで負圧発生部を構成する。混合空間７２より下流側には、エジェクタ４４からの水を外部に吐出するための水吐出部７４を備える。エジェクタ４４における混合空間７２のベンチュリー部７０に近い位置に、ホース５２と連絡する薬液連絡通路７６が形成される。この薬液連絡通路７６の途中に絞り７８を形成する。ホース５２の途中には、エジェクタ４４からタンク４６への水の流入を阻止するための逆止弁７９が備えられている。

【００１２】蛇口４０を開いて水道水をエジェクタ４４に供給すると、ベンチュリー部７０から断面積の広い混合空間７２に出た位置で負圧が発生する。この負圧によってホース５２並びに薬液連絡通路７６を介して混合空間７２に薬液が供給され、その混合空間７２内で水道水と薬液が混合され、混合された水道水と薬液が水吐出部７４から外部に吐出される。混合空間７２と水吐出部７４との間には、水通路６８の断面を横断するように丸棒８０が配置される。この丸棒８０によって水道水と薬液の混合が促進され、薬液や水道水に均一に希釈される。

【００１３】以上のように構成した本願発明では、エジェクタ４４とタンク４６とを互いの相対的位置が変位しない位置固定状態とした。これによって、タンク４６の液面とエジェクタ４４（混合空間７２への薬液連絡通路７６の連絡位置）とのヘッド差Ｈを一定の関係に保つことができる。図２の水位保持機構５０においては、タンク４６の液面は、液槽６０内の液面を意味し、その液面の高さは常に一定である。

【００１４】エジェクタ４４とタンク４６とを互いの相対的位置が変位しない位置固定状態としたので、本発明では、従来必要とした流量可変調節弁を備える必要がなくなる。また、エジェクタ４４とタンク４６とを位置固定状態としたので、タンク４６の液面とエジェクタ４４とのヘッド差Ｈが小さくなるため、水道水の流量の変化があっても薬液の希釈濃度の変化が少ない。このため、予め設定した絞り７８により、所望の希釈濃度を得ることが可能となる。

【００１５】ここで、タンク４６の液面の高さと、薬液連絡通路７６が混合空間７２に連絡する高さとのヘッド差をＨ（図２）とすると、０ｍｍ≦Ｈ≦６０ｍｍとするのが望ましい。ここでヘッド差Ｈが３０ｍｍの場合における水道水の流量と希釈濃度の特性を、図９において○印で示す。この○印で表した特性は、水道水の流量が増加しても希釈濃度の変化が小さいことを示している。図９には示さないが、ヘッド差Ｈが０ｍｍの場合には、ヘッド差Ｈが３０ｍｍの場合と比べて、流量が増大すると希釈濃度が若干増加するが、その増加程度は少ない。また、ヘッド差Ｈが６０ｍｍの場合には、ヘッド差Ｈが３０ｍｍの場合よりも希釈濃度の変化は小さい。

【００１６】ここで、ヘッド差Ｈの下限を０ｍｍとしたのは、エジェクタ４４に対するタンク４６のヘッド差Ｈがマイナスになると、水道水の流量が少ない時に薬液が供給されにくくなるからである。一方、ヘッド差Ｈが大きくなりすぎると、サイフォン現象により水道水を止めても薬液が流れ続けてしまう問題が生じる。ヘッド差Ｈの上限を６０ｍｍとしたのは、管路抵抗によってサイフォン現象を防止できるようにするためである。ヘッド差Ｈが６０ｍｍを超えるとサイフォン現象が発生するおそれがあり、それを防止するために特別な機構を付加しなければならず、コスト高になるからである。

【００１７】次に、本発明の変形例を図６に示す。図６において図１と同一符号は同一部材を表わす。水道の蛇

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口４０の先端には切換弁８２が取り付けられ、その切換弁８２はホース８４を介してエジェクタ４４に接続されている。切換弁８２は、水道水をそこから直接外部へ吐出するモードと、水道水をエジェクタ４４に導入するモードに切り換えるものである。図６においても、エジェクタ４４とケース４８は位置固定状態にされている。従って、図６においても、流量可変調節弁や逆止弁を省略して、水道水の流量が増加しても所望の安定した希釈濃度を得ることができる。

【００１８】

【発明の効果】以上のように、本願発明に係わる薬液希釈装置によれば、エジェクタとタンクとを位置固定状態とし、水位保持機構を設けてエジェクタとタンクとのヘッド差を一定としたので、従来必要とした流量可変調節弁を省略することができ、水道水の流量が増加しても薬液の希釈濃度の変化を小さくすることができる。更に、ヘッド差Ｈを０ｍｍ≦Ｈ≦６０ｍｍとすることで、水道水の流量が増加しても薬液の希釈濃度の変化を更に小さくすることができる。

【図面の簡単な説明】

【図１】本発明に係わる薬液希釈装置の一実施形態を示す斜視図である。

【図２】図１に用いるタンクと液槽とを示す断面図である。

【図３】タンクから液槽へ薬液を供給する状態を示す図２の要部拡大断面図である。

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【図４】本発明に用いるエジェクタの断面図である。

【図５】図４のＡ－Ａ線断面図である。

【図６】本発明に係わる薬液希釈装置の他の実施形態を示す斜視図である。

【図７】従来の薬液希釈装置を示す斜視図である。

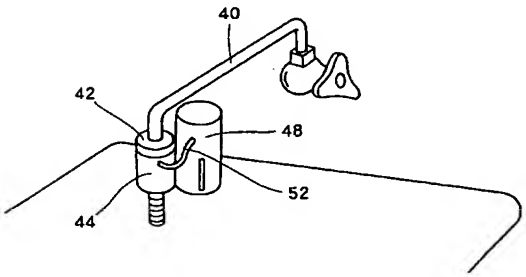
【図８】図７に用いるエジェクタの断面図である。

【図９】従来の薬液希釈装置と本発明の薬液希釈装置における水道水の流量と希釈濃度の特性を示す特性図である。

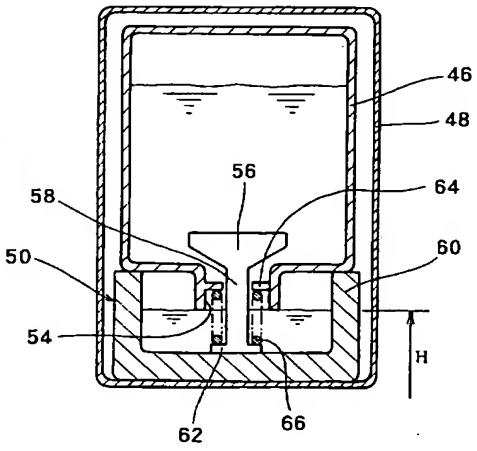
【符号の説明】

４０　蛇口
４４　エジェクタ
４６　タンク
４８　ケース
５０　水位保持機構
５２　ホース
５４　開口部
５６　弁体
６０　液槽
７０　ベンチュリー部
７２　混合空間
７６　薬液連絡通路
７８　絞り
８２　切換弁
８４　ホース

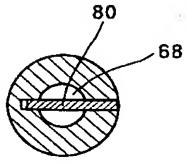
【図１】



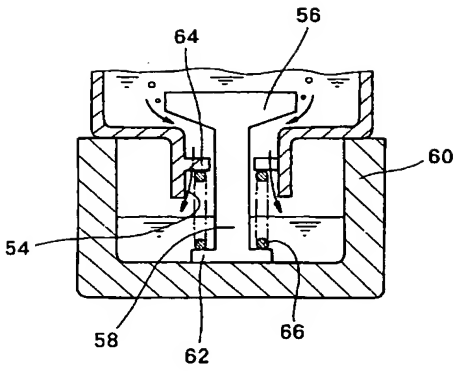
【図２】



【図５】



【図３】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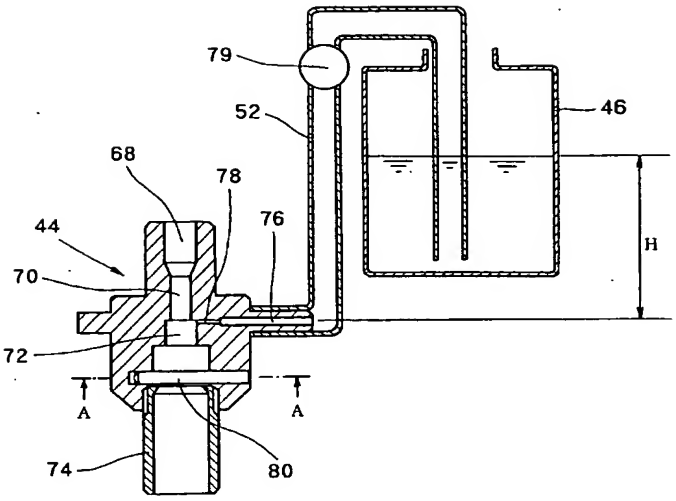
【図４】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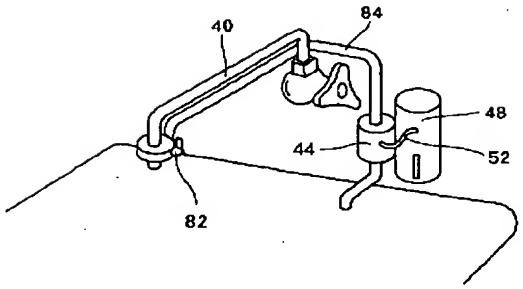
【図６】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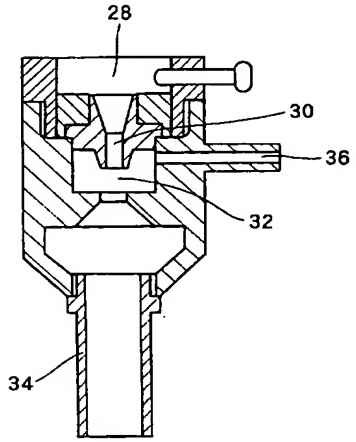
【図８】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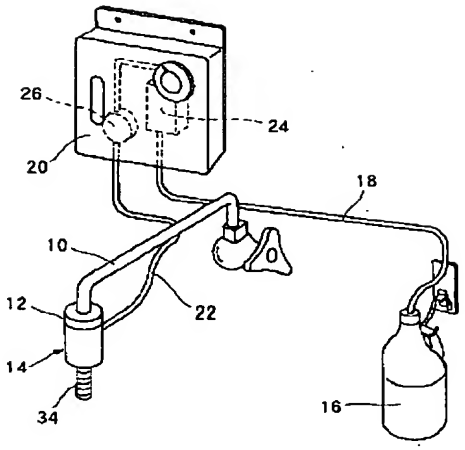
【図７】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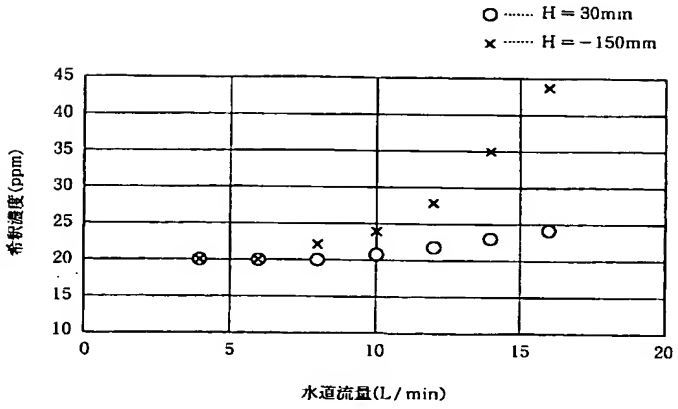
16

【図９】


○ …… H＝30mm
× …… H＝－150mm
45
40
35
30
25
20
15
10
0
5
10
15
20
希釈濃度(ppm)
水道流量(L/min)

フロントページの続き

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実開　昭56－98333（ＪＰ，Ｕ）
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実公　昭37－14265（ＪＰ，Ｙ１）

(58)調査した分野(Int.Cl.[7]，ＤＢ名)
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